

REMARKS

By this amendment, claims 1, 7, 9-16, 21 and 22 are canceled, and claims 2-6 and 8 and the specification are revised to place this application in condition for allowance. Currently, claims 2-6, 8, and 17-20 are before the Examiner for consideration on their merits.

In review, the Examiner noted an inconsistency in the specification and this has been addressed above.

In the prior art rejection, the Examiner rejects claims 1-22 based on either JP 10-204591 (JP '591) or 10-10204590 (JP '590), alone or in view of JP 7-145453 (JP '453). The Examiner is alleging that either JP '590 or '591 establishes a *prima facie* case of obviousness against the claims based on an overlap in compositional ranges. The Examiner also took the position that any structure defined by the product by process claim is found in the prior art based on the similarity in composition.

In response to the Office Action, claim 1 has been canceled and claim 6 has been amended to include the limitations of claim 1 concerning the composition and formulas. Claim 6 has also been amended to further recite the particulars of the partial recrystallization treatment.

It is respectfully contended that the applied prior art does not establish a *prima facie* case of obviousness against the ferritic steel sheet of claim 6, or that any alleged case of obviousness is rebutted by the evidence set forth in the specification.

The reason for this is that the metallic structure that is present in the sheet and formed as a result of the partial recrystallization heat treatment or the particular processing is not found in either JP '590 or '591. As will be explained in more detail below, the comparative evidence set forth in the specification shows that steels that are not subjected to the claimed partial recrystallization treatment behave differently than those that do, and therefore, the prior art steels of JP '590 or '591 are not the same as that claimed, nor is the invention an obvious variant thereof. In the alternative, the improvements in formability by controlling the heat treatment to produce a partially

recrystallized structure are totally unexpected and worthy of patent protection as a rebuttal of any allegation of obviousness.

In this regard, the Examiner's attention is directed to Figure 1 of the application. Therein, the difference in the r value (r_D) at 45 degrees at rolling direction is remarkably improved for the steel that has a partial recrystallization and then subjected to cold rolling and annealing. This improvement of r value (r_D) at 45 degrees at rolling direction brings improvements in the average plastic strain ratio r_{AV} and in-plane plastic anisotropy Δr or formability. As noted above, there is no recognition in the applied prior art as to the importance of this heat treatment to formability.

The Examiner's attention is also directed to Tables 3 and 4. While it may not be readily apparent, Table 3 shows steels subjected to the claimed partial recrystallization steps, whereas Table 4 uses a total recrystallization heat treatment when comparing the alloys falling within the compositional limits of claim 6 and those that do not, see page 20, lines 30-33.

Table 3 demonstrates that the alloy composition is critical for improvement by comparing steels abiding by the claim 6 limitations and those that do not. Table 4 makes a similar comparison between alloys following the limits of the invention as compared to those that do not, albeit with a total recrystallization heat treatment prior to cold rolling. Another important comparison to be made is between Tables 3 and 4, and specifically Steel Nos. 1-10 in Table 3 and Steel Nos. 1-10 in Table 4. The difference here is that Steels Nos. 1-10 in Table 3 were partially recrystallized, whereas the same steels in Table 4 were totally recrystallized. Comparing these two sets of steels reveals that the steels employing the partially recrystallizing heat treatment provide better r_{AV} and in-plane plastic anisotropy Δr than the same steels that were subjected to a total recrystallization. This translates to improved formability for the steel sheet having a partially recrystallized structure for cold rolling. Put another way, this means is that even a steel with the same composition does not have the same properties as one that is subjected to the partial recrystallization heat treatment specified in claim 6.

In the rejection, paragraph 9, the Examiner contends that the prior art alloy structure is essentially the same as that claimed without some evidence to the contrary.

The Examiner notes that the burden falls on Applicant to establish the criticality of the processing given the similarity in the applied prior art. It is contended that the arguments and evidence noted above does the very thing requested by the Examiner. That is, the specification demonstrates that controlling the heat treatment prior to cold rolling and annealing to produce a partially recrystallized structure results in improved formability.

While the Examiner may have contended that JP '590 or '591 establish a *prima facie* case of obviousness with regard to the steel sheet of claim 6, neither of these references teach or suggest anything about the claimed partial recrystallization step. The failure to make this suggestion coupled with the evidence set forth in the specification means that the Examiner cannot rely on either JP '590 or '591 to reject claim 6 under 35 U.S.C. § 103(a).

Even if the Examiner were to contend that it would be obvious to control the heat treatment prior to cold rolling, the unexpected improvements in formability for such a ferritic steel sheet rebuts any contention that the claimed ferritic steel sheet is an obvious by-product of the applied prior art. The specification shows without a doubt that the partial recrystallization heat treatment prior to cold rolling and annealing does produce a metallic structure that is different than a metallic structure derived from a totally recrystallized material. The structures are different since the sheet subjected to the partial recrystallization heat treatment exhibits improved formability in terms of the r_{AV} and in-plane plastic anisotropy Δr values. Therefore, any allegation of obviousness is either misplaced or effectively rebutted and the rejection as applied to claim 6 must be withdrawn.

In addition, it is respectfully submitted that the comparative evidence in the application indicates that the composition is critical in order to attain excellent high temperature strength, high temperature oxidation resistance, and low temperature toughness. More specifically, the composition is controlled to obtain a balance of Si and Cr for improved formability and high temperature oxidation resistance, see page 6, lines 8-13, a combination of Ti and Nb for improved deep drawability, see page 6, lines 14-21, and a combination of Cu and B for low temperature toughness. The comparative evidence shows the criticality of claim 6 in Tables 3 and 4.

While the compositions of JP '590 or '591 may be close to that of the claimed alloy, there is no recognition in either of these alloys of the importance of the control of the claimed alloying elements. Table 2 shows that control of Si, Mn, Cr, Cu Ti, Nb, Al, and B are important in producing an alloy having properties not found in the prior art. This is further evidence that neither JP '590 nor '591 teaches or fairly suggests the invention and that the rejection based on these prior art references should be withdrawn.

The second reference, JP '453, was relied upon by the Examiner to allege that the addition of Y or rare earth elements are known. Regardless of the teaching of JP '453, this reference does not supply the deficiencies in either JP '590 or '591 regarding their respective absence of any teaching regarding a partial recrystallization heat treatment prior to cold rolling and annealing. Thus, even if JP '453 were combined with either of the primary references, the invention of claim 6 is still not taught.

Since claim 6 has been shown to be patentable over the applied prior art, its dependent claims are also in condition for allowance.

Accordingly, the Examiner is respectfully requested to examine this application in light of this Amendment and pass claims 2-6, 8, and 17-20 onto issuance.

If the Examiner believes that an interview with Applicants' attorney would be helpful in expediting allowance of this application, the Examiner is respectfully requested to telephone the undersigned at 202-835-1753.

Again, reconsideration and allowance of this application is respectfully requested.

The above constitutes a complete response to all issues raised in the Office Action dated May 26, 2005.

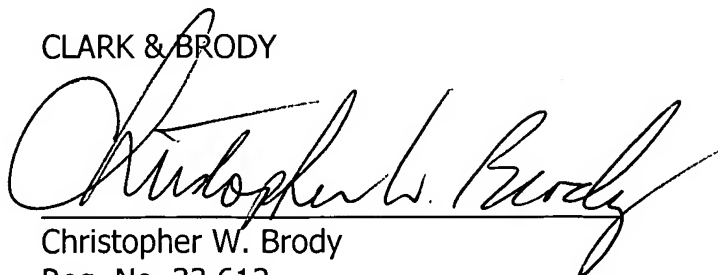
A petition for a three month extension of time is hereby made. A check covering the cost of the petition fee is attached.

Application No.: 10/670,284

Please charge any fee deficiency or credit any overpayment to Deposit Account
No. 50-1088.

Respectfully submitted,

CLARK & BRODY

A handwritten signature in cursive script, reading "Christopher W. Brody", written over a horizontal line.

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Table 2

	No.	C	Si	Mn	Ni	Cr	Mo	Cu	Ti	Nb	V	Al	B	N	Other	(Mass%)		
																3Cr+	Cr+	AM value
C	22	0.010	0.51*	0.15	0.11	10.92	tr.	tr.*	0.24	tr.*	tr.	0.08	tr.*	0.008	-	40Si	10Si	53.2
	23	0.009	0.56*	0.16	0.37	18.74*	tr.	0.43	tr.*	0.41	0.07	0.01	tr.*	0.014	-	78.6	24.3*	-21.6
m S	24	0.009	0.96	1.07*	0.14	13.58*	tr.	0.10	tr.*	0.51	0.04	0.02	tr.*	0.009	-	79.1	23.2*	26.6
	25	0.023*	0.56*	0.80	0.10	11.71*	tr.	0.24	0.11	0.59*	0.03	0.01	0.0009	0.004	-	57.5*	17.3	48.1
p t	26	0.010	0.68*	0.17	0.09	8.73	tr.	0.10	0.10	0.31	0.01	tr.	0.0022	0.009	-	53.4*	15.5	80.5*
	27	0.007	0.92	0.21	0.10	10.42	0.06	0.61*	0.14	0.26	0.03	0.01	0.0014	0.008	-	68.1	19.6	59.2
r e	28	0.008	0.90	0.15	0.10	10.39	0.01	0.10	0.35*	0.24	0.02	tr.	0.0017	0.008	-	67.2	19.4	46.8
	29	0.006	1.24*	0.16	0.01	8.39	0.02	0.11	0.17	0.29	0.02	0.01	0.0021	0.008	-	74.8	20.8	70.0
t s	30	0.009	0.88	0.23	0.11	10.23	tr.	0.13	0.13	0.31	0.04	0.21*	tr.*	0.007	La:0.01 Ce:0.04	65.9	19.0	47.6
	31	0.010	0.96	0.25	0.09	9.96	tr.	0.09	0.16	0.30	0.03	0.01	0.0252*	0.007	Mg:0.001	68.3	19.6	58.9

tr.: Trace

*: Outside invention range